

PATENT CLAIMS

1. Sonic or ultrasonic transducer (1) comprising: A disc-shaped piezoelectric unit (2); a ring-shaped coupling element (3) surrounding the piezoelectric unit (2) with a form- and force-fit; a matching layer (4) arranged in front of the piezoelectric unit (2) in the direction of radiation of the sonic or ultrasonic waves; and a transmitting/receiving unit (11) which excites the piezoelectric unit (2) to execute radial oscillations;

characterized in that

the matching layer (4) is made of a material which has dimensional stability up to a temperature lying above the temperature at the installation location of the sonic or ultrasonic transducer (1);

the material-specific coefficient of thermal expansion of the material of the matching layer (4) is greater than that of the materials of the piezoelectric unit (2) and/or the coupling ring; and

the modulus of elasticity of the material of the matching layer (4) is at least one order of magnitude smaller than that of the piezoelectric unit (2) and/or the coupling ring (3).

2. Sonic or ultrasonic transducer as claimed in claim 1, characterized in that the matching layer (4) is made of a hard foam material.

3. Sonic or ultrasonic transducer as claimed in claim 1, characterized in that the coupling ring (3) is made of metal or ceramic.

4. Sonic or ultrasonic transducer as claimed in claim 1, 2, or 3, characterized in that

a protective foil (5) is provided in front of the matching layer (4) in the direction of radiation of the sonic or ultrasonic waves, and is arranged such that it protects the matching layer (4), on the side of the matching layer (4) facing in the direction of radiation, from the penetration of moisture and other foreign matter.

5. Sonic or ultrasonic transducer as claimed in claim 4, characterized in that the protective foil (5) is made of metal.

6. Sonic or ultrasonic transducer as claimed in claim 1, characterized in that a housing (8) is provided, in which the matching layer (4) and the piezoelectric unit (2) with the coupling ring (3) are arranged, and a potting compound (7) is provided, which is arranged at least in some areas between the matching layer (4), the piezoelectric unit (2), the coupling ring (3), and the inner wall of the housing (8).

7. Sonic or ultrasonic transducer as claimed in claim 1 or 6, characterized in that the potting compound (7) is an elastomeric potting compound.

8. Sonic or ultrasonic transducer as claimed in one or more of the claims 1 through 7, characterized in that

a diffusion barrier (6) is provided, which is arranged on the potting compound (7) facing away from the direction of radiation.